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KINDS OF FEATHERS OF *COLUMBA LIVIA* :

In pigeon, the feathers are variously modified to serve different functions.

They may be of following kinds:

1. Quill or Flight Feathers:

The quill feathers have a strong rachis or shaft having barbules with an interlocking arrangement.

They are classified into following types:

(i) Remiges:

The quill feathers occurring on the wings and serving the purpose of flight are called pinions, **wing quills or remiges** (singular, remex). In remiges the posterior half of the vane is slightly broader than the outer or anterior half. Each wing of pigeon has 23 remiges which remain attached to its hinder border.

Out of 23 remiges, eleven remiges are attached to the hand and are called **primaries or manuals**. The seven of these are attached to the metacarpal region and are called metacarpals. The remaining 4 are attached to the second and third digits and are called digitals which are further distinguished into- one ad-digital connected with the single phalanx of 3rd digit, 2 mid-digitals attached with the proximal phalanx of 2nd digit, and

2 pre-digitals with the distal phalanx of 2nd digit. The remaining 12 remiges are attached with the ulna of forearm and are called secondaries or cubitals. At the anterior border of the first digit (pollex) are attached a tuft of feathers called **ala spuria** or bastard wing.

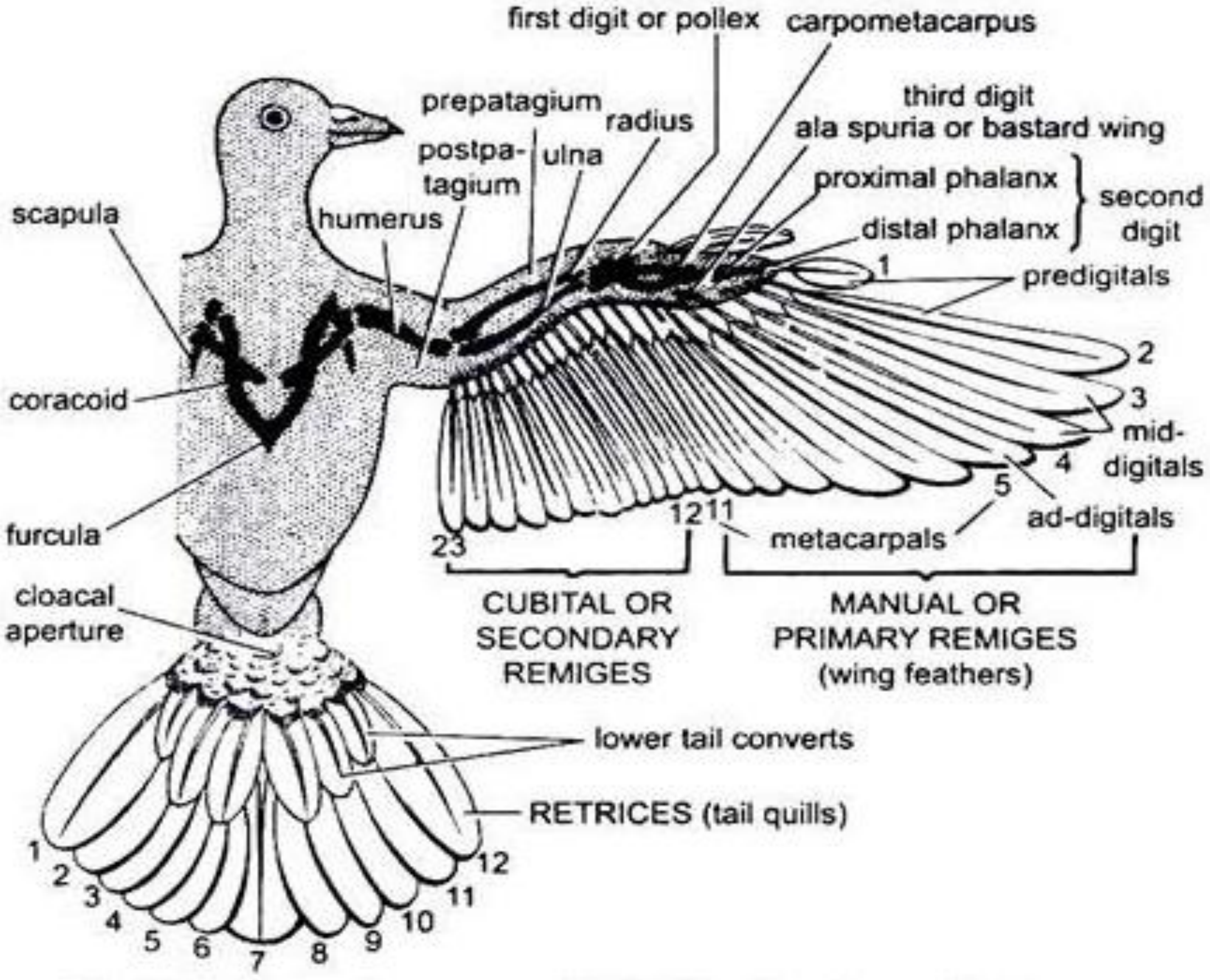

Fig. 3 Pigeon. Arrangement of flight feathers in ventral view.

(ii) Rectrices:

The quill feathers occurring around the uropygium to form the tail of pigeon are called **tail-quills** or **rectrices**. In pigeon, twelve long rectrices are arranged in semicircle or fan-like manner on the tail or uropygium. In rectrices two halves of the vanes are almost equal in size. The rectrices act as a brake in alighting and as a rudder in vertical or lateral steering.

(iii) Coverts:

The quill feathers covering the bases of wing quills and tail quills are called **coverts**. The bases of the wing-quills are covered by several rows of upper and under wing- coverts, and the bases of the tail quills by upper and under tail-coverts. They are of smaller size than the quill feathers but both are structurally similar. They close the interstices between the calamuses (quills) of remiges and rectrices and, thus, presenting a continuous area to oppose the buoyancy of the air.

(iv) Contours:

The quill feathers forming the general covering of the body are called **contours** They are smaller and woolly feathers having poorly developed barbules due to which barbs can be easily separated. These provide warmth and the smooth air flow, without turbulence.

2. Filoplumes (Hair Feathers or Pin Feathers):

The filoplumes are small, delicate, hair-like feathers which remain sparsely distributed over the body among the contour feathers. A filoplume consists of a short calamus and a long thread-like rachis with a few weak terminal barbs, and barbules without any hamuli.

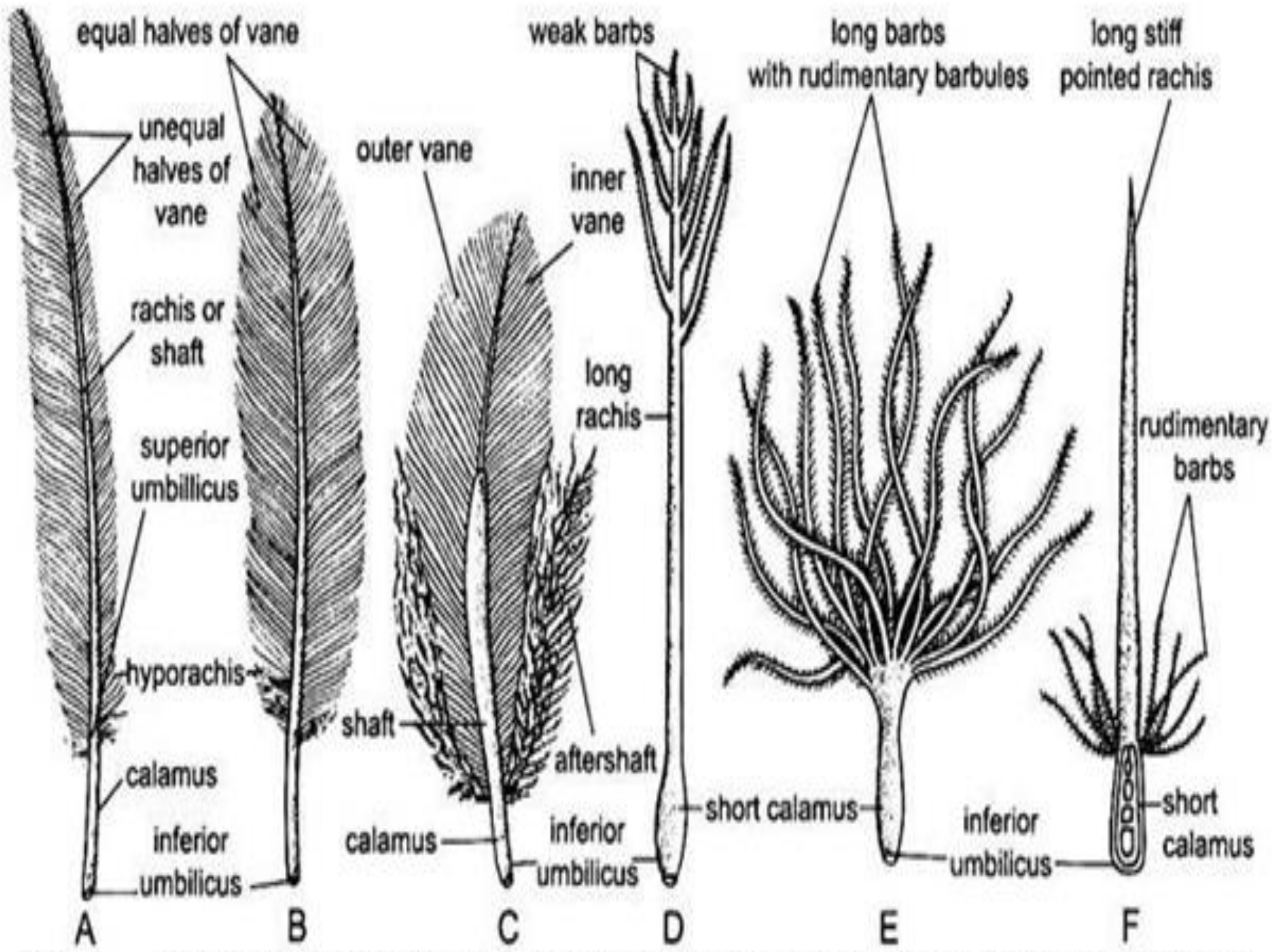

Fig. 4 Pigeon. Kinds of feathers. A-Remex; B-Rectrix; C-Contour; D-Filoplume; E-Down; F-Rictal bristle (not found in pigeon).

3. Down Feather or Plumule:

The down feathers are small, soft and woolly and lack the rachis but have a short calamus. The calamus bears a fluffy tuft of barbs which are long, flexible and with short barbules having no hamuli. In a young one, the down feathers cover the body and are called **nestling down feathers.** They have a horny sheath covering the quill and basal portions of barbs. In adult pigeon, the nestling down feathers are replaced by contour feathers. But, they persist as an undercoat beneath the contour feathers in many aquatic birds, such as ducks and swans, serving to increase the thickness of the insulating layer.

Other Kinds of Feathers in Birds:

4. Powder-Down Feathers:

These are specialised type of feathers, well-developed in tracts or powder-down patches in herons, parrots and cockatoos, birds of prey, instead of pigeons . These feathers produce some powdery fragments for cleaning the plumage.

5. Rictal Bristles:

Some birds, such as fly catchers, goat-suckers and whippoorwills, have stiff hair-like feathers called rictal bristles at the base of bill (rictus) and eyes. Each rictal bristle has a short calamus, and a slender rachis with a few rudimentary barbs at its base. They do not occur in pigeons.

6. Other Types:

There are certain other kinds of feathers which do not occur in pigeons, but occur in different birds. For example, **tactile feathers or vibrissae** occur at the root of the beaks or round the eyes of nocturnal birds, such as owl. Other peculiar feathers, such as bristles at the gape of Night jars, eyelashes of Hornbills, wires of birds of paradise and ornamental plumes of many birds, are modified contour feathers.

Pterylosis:

The arrangement or distribution of feathers on the body is called pterylosis. In pigeons and majority of birds, except penguins, the feathers are not uniformly distributed over the whole body but are arranged in distinct patches or tracts called pterylae.

The pterylae are followed by featherless areas or apteria which are covered with filoplumes in pigeons and by down feathers in ducks and many other birds. In flightless birds apteria are usually found only in the young, the adult having a uniform covering of feathers.

The principal feather tracts or pterylae of pigeon are following:

(i) **Head or cephalic.** Covering the head.

(ii) **Neck or cervical**. On the neck.

(iii) **Shoulder or humeral**. Across the upper arm or humerus,

(iv) **Spinal**. Extending from neck to tail along the vertebral column,

(v) **Ventral**. It is a double tract with one branch running along each side of the breast.

(vi) **Wing or alar.** Composed of remiges with their coverts.

(vii) **Tail or caudal.** Composed of rectrices with their coverts.

(viii) **Femoral or lumbar.** Spreading obliquely on the outer side of the thigh,

(ix) **Crural**. Covering the shank of leg.

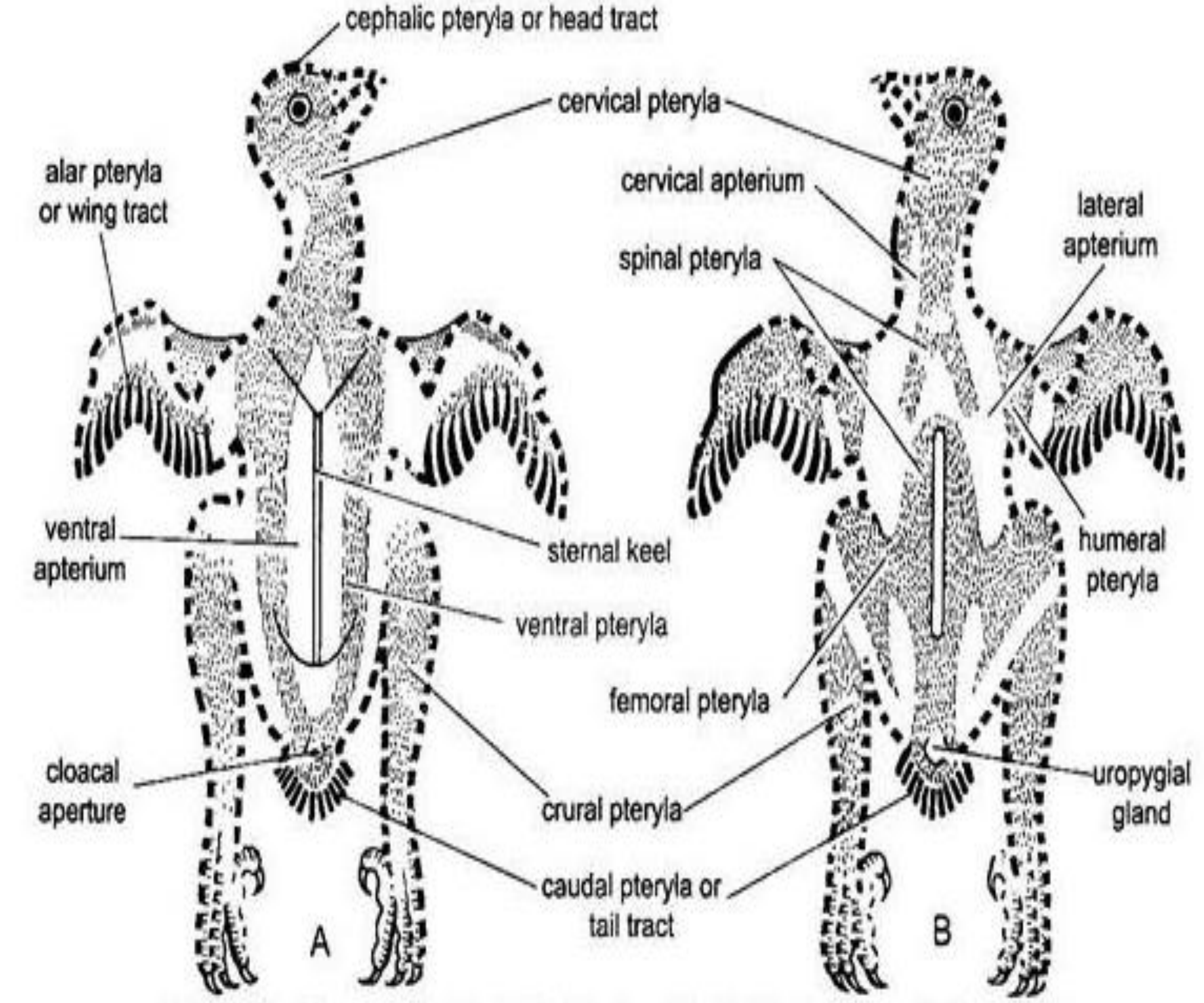

Fig. 5 Pigeon. Pterylosis (feather tracts). A–Ventral view; B–Dorsal view.